National Institute of Environmental Health Sciences

# Climate change, air quality, and human health

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**Abstract:**

Weather and climate play important roles in determining patterns of air quality over multiple scales in time and space, owing to the fact that emissions, transport, dilution, chemical transformation, and eventual deposition of air pollutants all can be influenced by meteorologic variables such as temperature, humidity, wind speed and direction, and mixing height. There is growing recognition that development of optimal control strategies for key pollutants like ozone and fine particles now requires assessment of potential future climate conditions and their influence on the attainment of air quality objectives. In addition, other air contaminants of relevance to human health, including smoke from wildfires and airborne pollens and molds, may be influenced by climate change. In this study, the focus is on the ways in which health-relevant measures of air quality, including ozone, particulate matter, and aeroallergens, may be affected by climate variability and change. The small but growing literature focusing on climate impacts on air quality, how these influences may play out in future decades, and the implications for human health is reviewed. Based on the observed and anticipated impacts, adaptation strategies and research needs are discussed.

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## Resource Description

**Climate Scenario :**

specification of climate scenario (set of assumptions about future states related to climate)

Special Report on Emissions Scenarios (SRES)

**Special Report on Emissions Scenarios (SRES) Scenario:** SRES A2

**Exposure :**

weather or climate related pathway by which climate change affects health

Air Pollution, Meteorological Factors

**Air Pollution:** Allergens, Dust, Interaction with Temperature, Ozone, Particulate Matter, Other Air Pollution

**Air Pollution (other):** NOx, VOCs

**Geographic Feature:**

resource focuses on specific type of geography

None or Unspecified

**Geographic Location:**

resource focuses on specific location

Non-United States, United States

**Non-United States:** Europe, Non-U.S. North America

**Health Co-Benefit/Co–Harm (Adaption/Mitigation):**

specification of beneficial or harmful impacts to health resulting from efforts to reduce or cope with greenhouse gases

A focus of content

**Health Impact:**

specification of health effect or disease related to climate change exposure

Cardiovascular Effect, Dermatological Effect, Respiratory Effect

**Cardiovascular Effect:** Other Cardiovascular Effect

**Cardiovascular Disease (other):** cardiovascular mortality

**Respiratory Effect:** Asthma, Upper Respiratory Allergy, Other Respiratory Effect

**Respiratory Condition (other) :** respiratory mortality

**Mitigation/Adaptation:**

mitigation or adaptation strategy is a focus of resource

Adaptation

**Model/Methodology:**

type of model used or methodology development is a focus of resource

Exposure Change Prediction

**Population of Concern:** A focus of content

**Other Vulnerable Population:** people with existing respiratory disease

**Resource Type:**

format or standard characteristic of resource

Review

**Resilience:**

capacity of an individual, community, or institution to dynamically and effectively respond or adapt to shifting climate impact circumstances while continuing to function

A focus of content

**Timescale:**

time period studied

Long-Term (>50 years)